National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 696

Bauxite (Surinam)

(In Cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is in the form of fine powder (nominal particle size < 0.08 mm) and is intended for use in evaluating chemical and instrumental methods of analyses.

(All analyses are based on samples dried 2 hours at 140 °C)

Constituent	Certified Value[1] Percent by Weight	Estimated Uncertainty[2]
Al_2O_3	54.5	0.3
Fe_2O_3	8.70	.10
SiO_2	3.79	.10
TiO_2	2.64	.05
ZrO_2	0.14	.02
P_2O_5	.050	.006
V_2O_5	.072	.006
Cr_2O_3	.047	.003
CaO	.018	.002
MgO	.012	.003
MnO	.004	.001
ZnO	.0014	.0007
K_2O	.009	.003
SO_3	.150	.002
Loss on Ignition[3]	29.9	.2

[1]The certified value listed for a constituent is the present best estimate of the "true" value. The certified values are given as the oxide on an equivalent weight basis and assume stoichiometry in the form of the compounds listed.

[2]The estimated uncertainty listed for a constituent is based on judgment and represents an evaluation of the combined effects of method imprecision, possible systematic errors among methods, and material variability for samples 1.0 g or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents.)

[3]Determined by igniting to constant weight at 1050 °C.

Gaithersburg, MD 20899
January 1, 1991
(Revision of certificate dated 8-24-79)

William P. Reed, Acting Chief
Standard Reference Materials Program

(over)

ADDITIONAL INFORMATION ON THE COMPOSITION

Constituents other than those certified are present in this material as indicated below. They are not certified but are given as additional information on the composition.

Constituent	Concentration, Percent by weight	Constituent	Concentration, Percent by weight
BaO	(0.004)	Co	(0.00009)
Na_2O	(0.007)	Hf	(0.0032)
Ce	(0.0041)	Sc	(0.0008)

The mineralogical composition of SRM 696b is 5% kaolinite, 80% gibbsite, 10% pyrite, and 5% anatase. It was determined by x-ray diffraction studies at the Geological Survey, U.S. Department of the Interior, Reston, VA., (J.W. Hosterman). These results are semiquantiative (to the nearest 5%).

PLANNING, PREPARATION, TESTING, ANALYSIS:

The material for this SRM was mined in Surinam, South America, and was provided by the Aluminum Company of America, Alcoa Technical Center, Pittsburgh, PA, through the courtesy of H.B. Hartman. It was processed (crushed, ground, sieved, and mixed) at the Colorado School of Mines Research Institute under a contract with the National Institute of Standards and Technology.

Homogeneity testing was performed at NIST by J.S. Maples and T.E. Gills using instrumental neutron activation analysis.

Cooperative analyses for certification were performed in the following laboratories:

- Aluminum Company of America, Alcoa Center, PA, R.C. Obbink.
- Aluminum Company of Canada, Ltd., Arvida Research Center, Arvida, Quebec, Canada, L. Girolami.
- Andrew S. McCreath & Son, Inc., Harrisburg, PA, F.A. Pennington, Jr., R.F. Eakin, and S.L. Miller.
- General Refractories Co., U.S. Refractories Division, Research Center, Baltimore, MD, S. Banerjee.
- Geological Survey, U.S. Department of the Interior, Reston, VA, H.J. Rose, Jr., and J.W. Hosterman.
- Kaiser Aluminum and Chemical Corp., Center for Technology, Pleasanton, CA, H.J. Seim, A.E. McLaughlin, D.F. G. Marten, A. Kermaninejad, R.C. Kinne, J.R. Skarset, J. Boruk, and U. Vogel.
- National Institute of Standards and Technology, Gaithersburg, MD R.K. Bell (Retired), ASTM- NIST Assistant Research Associate, W.R. Kelly and K.E. Murphy.
- National-Southwire Aluminum Co., Hawesville, KY, N. Robinson and E. Gotzy.
- Armet Corp., Burnside, LA, W.L. Brown and P.D. Lafleur.
- Reynolds Aluminum Co., Alumina Research Division, Bauxite, AR, J.B. Ezell, Jr.
- University of Kentucky, Institute for Mining and Minerals Research, Center for Energy Research Laboratory, Lexington, KY, T.V. Rebagay.

The overall coordination of the technical measurements leading to certification were performed under the direction of J.I. Shultz, Research Associate, ASTM-NIST Research Associate Program.

The original, technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Standard Reference Materials Program by R.E. Michaelis and R. Alvarez.

The update and revision of this Certificate of Analysis was coordinated through the Standard Reference Materials Program by T.E. Gills.

NIST Standard Reference Materials

BAUXITE SERIES

January 2, 1991

R.E. Michaelis and R. Alvarez, NIST Standard Reference Materials Program

and J.I. Shultz, ASTM Research Associate

The values for the series of bauxite Standard Reference Materials (SRMs) are given in the following table. They are available in the form of fine powders (<0.08 mm). The bauxite series is issued as a culmination of a major industry-ASTM/NIST cooperative program.

SRM No.	69b	600	696	697	698
Designation/	Arkansas	Australian	Surinam	Dominican	Jamaican
Constituent		Percent by Weight			
Al_2O_3	48.8	40.0	54.5	45.8	48.2
Fe_2O_3	7.14	17.0	8.70	20.0	19.6
SiO_2	13.43	20.3	3.79	6.81	0.69
TiO_2	1.90	1.31	2.64	2.52	2.38
ZrO_2	0.29	0.060	0.14	0.065	0.061
P_2O_5	0.118	0.039	0.050	0.97	0.37
V_2O_5	0.028	0.060	0.072	0.063	0.064
Cr_2O_3	0.011	0.024	0.047	0.100	0.080
CaO	0.13	0.22	0.018	0.71	0.62
MgO	0.085	0.05	0.012	0.18	0.058
MnO	0.110	0.013	0.004	0.41	0.38
ZnO	0.0035	0.003	0.0014	0.037	0.029
BaO	(0.008)[a]	---	(0.004)	(0.015)	(0.008)
Na_2O	(0.025)	0.022	(0.007)	(0.036)	(0.015)
K_2O	0.068	0.23	0.009	0.062	0.010
SO_3	0.551	0.155	0.150	0.0769	0.144
Loss on Ignition	27.2	20.5	29.9	22.1	27.3
Ce	(0.024)	---	(0.0041)	(0.069)	(0.030)
Co	(0.0001)	---	(0.00009)	(0.0013)	(0.0045)
Hf	(0.0063)	---	(0.0032)	(0.0014)	(0.0015)
Sc	(0.0008)	---	(0.0008)	(0.0058)	(0.0051)
Total	(100.0)	(99.99)	(100.1)	(100.1)	(100.1)

[a] Values in parenthesis are not certified.

The value listed for a certified constituent is the present best estimate of the"true" value based on the results of the analytical program for certification involving 10-12 laboratories. The individual certificates of analysis list the "estimated uncertainties" associated with the certified values.

Inquiries regarding the bauxite SRMs 69b, 600, 696, 697, and 698, should be directed to Standard Reference Materials Program, Building 202, Room 215, National Institute of Standards and Technology. Telephone (301) 975-6776; FAX (301) 948-3730.